



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/561,954	05/17/2006	Kazuaki Sawada	283643US2PCT	3221

22850 7590 03/05/2008
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER

BENNETT, JENNIFER D

ART UNIT	PAPER NUMBER
----------	--------------

2878

NOTIFICATION DATE	DELIVERY MODE
-------------------	---------------

03/05/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

Office Action Summary	Application No. 10/561,954	Applicant(s) SAWADA ET AL.	
	Examiner JENNIFER BENNETT	Art Unit 2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☒ Claim(s) 6-8 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 December 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>3/15/2006</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p) (5) because they do not include the following reference sign(s) mentioned in the description: “part C” and “part B” on page 14 lines 14, 15, and 17. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p) (5) because they include the following reference character(s) not mentioned in the description: “9” in figure 1. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) is required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet”

or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

3. Claims 1, 2, 3, and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogawa (US 4896049) in view of Hara et al. (US 5581094) and Kalkhoran et al. (US 5726440).

Re claims 1 and 3: Ogawa teaches a spectroscopic sensor comprising (fig. 3c): (a) a semiconductor substrate (1); (b) a first diffusion layer provided on the semiconductor substrate (13); (c) a second diffusion layer provided at a part of the first diffusion layer (15); and (d) an electrode film (14) provided on the first diffusion layer (see fig. 3c) with an insulating film provided there between (6, 6'). Ogawa does not teach the electrode film transmitting incident light and being applied with a gate voltage, wherein (e) the gate voltage is varied, the depth from the surface of the first diffusion layer in which electrons generated by the incident light are captured is varied so as to correspond to the gate voltage, and a current indicating the quantity of the electrons is measured, thereby measuring wavelength and intensity of the incident light. Hara teaches a spectroscopic sensor comprising (fig. 4) the electrode film transmitting incident light (53), and being applied with a gate voltage (55), wherein (e) the gate voltage is varied (col. 25, lines 31-32), the depth from the surface of the first diffusion layer (57) in which electrons generated by the incident light are captured is varied so as to correspond to the gate voltage (col. 25, lines 33-35), and a current indicating the

quantity of the electrons is measured, thereby measuring intensity of the incident light (col. 25, lines 64-67, col. 26, lines 36-43). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the spectroscopic sensor of Ogawa with the varying voltage applied to the electrode of Hara to have increased light utilization factor and an enhanced sensitivity (Hara, col. 26, lines 47-49). Ogawa as modified by Hara does not teach that the spectroscopic sensor wherein the depth from the surface of the first diffusion layer in which electrons generated by the incident light are captured is varied so as to correspond to the gate voltage, and a current indicating the quantity of the electrons is measured, thereby measuring wavelength. Kalkhoran teaches a wavelength selective photodetector (fig. 1, fig. 2) that is dependent upon the thickness of a p-type doped layer (108, fig. 2)(col. 5-6, lines 66-67, lines 1-12). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the spectroscopic sensor of Ogawa as modified by Hara with the wavelength measuring technique of Kalkhoran in order to have a filter-less wavelength sensor (col. 2, lines 28-29).

Re claim 2: Ogawa in view of Hara and Kalkhoran teaches the method for measuring incident light, wherein the number of times of varying the gate voltage is set according to the type of the incident light (Hara, col. 6, lines 13-14).

Re claim 4: Ogawa teaches the spectroscopic sensor, wherein the first diffusion layer (15) comprises a p-type diffusion layer (col. 3, lines 13-14, the drawing states 15 that is what the spec. should state), the second diffusion (13) layer comprises an n+

diffusion layer (col. 3, line 12), and the semiconductor substrate (1) comprises an n-type semiconductor substrate (col. 7, lines 54-58).

4. Claim 5 rejected under 35 U.S.C. 103(a) as being unpatentable over Ogawa (US 4896049) as modified by Hara et al. (US 5581094) and Kalkhoran et al. (US 5726440) as applied to claim 3 above, and further in view of Ogawa et al. (US 4345021).

Re claim 5: Ogawa '049 as modified by Hara and Kalkhoran teaches the spectroscopic sensor, wherein the electrode film (14) being applied with a gate voltage is a poly-silicon film (col. 9, line 12, poly-silicon is the same as polycrystalline silicon). Ogawa as modified by Hara and Kalkhoran does not teach wherein the electrode film being applied with a gate voltage is a polycrystalline silicon film doped with an impurity. Ogawa '021 teaches the use of a transparent electrode film (26) doped with impurities (col. 4, lines 33-37). It would have been obvious to one of ordinary skill at the time the invention was made to combine the gate electrode film of Ogawa '049 as modified by Hara and Kalkhoran with the electrode doped with an impurity of Ogawa '021 in order to more efficiently transmit light to the diffusion layer providing for a better measurement of incident light applied to the sensor.

Allowable Subject Matter

5. Claims 6-8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Re claim 6: The prior art of record individually or in collaboration fails to teach a spectroscopic sensor, wherein the gate voltage is varied, the depth from the surface of the first diffusion layer in which electrons generated by the incident light are captured is varied so as to correspond to the gate voltage, and a current indicating the quantity of the electrons per the electrons is measured, thereby measuring wavelength and intensity, wherein the spectroscopic sensor array is switched with a shift register formed with the spectroscopic sensor array to read signals, the depth for capturing electrons is varied to measure signals at each time, and the intensities of wavelengths of red, green, and blue are calculated from the signals to output color image signals.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Nozaki et al. (US 4677289).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JENNIFER BENNETT whose telephone number is (571)270-3419. The examiner can normally be reached on Monday - Friday 0730 - 1700 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on 571-272-2328. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. B./

/Georgia Y Epps/
Supervisory Patent Examiner, Art Unit 2878